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ENTOMOLOGY.[1]

Entomology at Indianapolis.—The attendance of entomologists at the recent meeting of the A. A. A. S., while not as large as could be wished, was fully up to the average. We give below abstracts of a number of the papers read, while several others are reserved for future discussion. The first three following were presented before the Society for the Promotion of Agricultural Science, while the remainder were read before the Entomological Club of the A. A. A. S.

INSECTS PRODUCING SILVER-TOP IN GRASS.—Professor Herbert Osborn, in an excellent paper, said the "silver-top" in grass is a whitening of the upper portion of the stalk, especially the head, which withers without maturing seed. Meromyza, Chlorops, and Thrips have been credited with being the cause of the mischief. Professor Comstock has shown that *Limothrips poaphagus* is often the cause. The injury may result from any attack upon the juicy base of the terminal node that cuts off the flow of sap to the head. Fully 90 per cent. of a large number of grass-stems examined contained no insects within the sheath. Many of them did show the punctures of Homoptera, especially Jassidæ, about the upper node, and it is probable that these leaf-hoppers are responsible for much of the "silver-top." These insects are open to general attack, and the injury should be prevented by their destruction.

ARTIFICIAL PASTURAGE FOR BEES.—In a paper on this subject, Professor A. J. Cook reported experiments in planting Rocky Mountain Bee Plant (*Cleome integrifolia*), Chapman Honey Plant (*Echinops spherocephalus*), and a foreign mint (*Melissa sp.*). None of the experiments were successful, and the conclusion is reached that it is doubtful policy to sow any plant for its nectar alone. The best results will probably come in combining nectar secretion with some other useful quality.

FERTILIZERS AS INSECTICIDES.—In a paper entitled Fertilizers as Insecticides and Insecticides as Fertilizers, Prof. J. B. Smith reported the results of some interesting experiments. The author has lost all faith in "repellents." No matter how bad a smell may be created, if it does not act destructively as well, it is useless. All sorts of decaying or decomposing matter is attractive rather than offensive to insects. Barnyard manure has no repellent or insecticidal value. Phosphates were used without success, but potash, in the form of muriate and kainit, has proved a valuable insecticide. In the proportion of one ounce to one pint of water muriate of potash destroys plant-lice, mealy bugs, bark-lice, and thousand-legged worms (Iulus,—called by the author of the paper "wire-worms," a misleading term). Kainit gave similar results. Hairy caterpillars, beetles, and bugs are not affected by these substances. Tobacco was also shown to be ot decided value, both as an insecticide and a fertilizer.

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[1] Edited by Dr. C. M. Weed, Experiment Station, Columbus, O.

TEACHING ENTOMOLOGY.—Professor A. J. Cook, in his presidential address before the Entomological Club, discussed the methods of teaching entomology in use at the Michigan Agricultural College. All students are required to make drawings, and to dissect, rear, and collect insects. Reference collections are always within reach. The course of study should include botany, free-hand drawing, French, and German. The address was listened to with marked interest, and some admirable examples of drawing by Professor Cook's students were exhibited.

A WATER-LILY MOTH.—Professor D. S. Kellicott described the life-history of *Eustrotia caduca*. The larva feeds upon the fruit and leaves of *Nuphar advena*. The eggs are placed on the upper side of floating Nuphar leaves in irregular patches of a few in number. They are hemisphericaly 1 mm. in diameter, and with a waxy hue; the surface is beset by about thirty meridianal, nodular ridges. The young escapes by cutting nearly off a round lid which it lifts on a hinge. The larvæ mature in July, and spin delicate white silken cocoons upon the leaves. The imagos begin to issue after a pupal period of eight days.

OVIPOSITION OF THE SAGITTARIA CURCULIO.—Dr. C. M. Weed reported observations showing that the Sagittaria Curculio (*Listronotus latiusculus* Boh.) deposits its eggs, largely during July, in small bunches, usually of between five and ten, upon the leaf and flower stalks of Sagittaria. After being laid they are covered with minute particles of the epidermis of the stalk, chewed off by the parent beetle, and probably fastened together by some sticky secretion. Enough of these particles of epidermis are placed over the eggs to make a conical covering 1.5 mm. in diameter at the base, and 0.7 mm. high. When the larvæ hatch from the small yellowish-white eggs they bore directly into the stem, leaving the empty egg-shells and their protective covering still in place.

OVIPOSITION OF DECTES SPINOSUS.—In describing the egg-laying habits of the Cerambycid beetle, *Dectes spinosus*, Dr. Weed said the egg in a case observed was deposited obliquely in the pith of the stem of horse-weed (*Ambrosia trifida*). The outer fibres are first gnawed away to allow the insertion of the ovipositor. The egg is 2 mm. long by 0.3 mm. wide, elongate-oval, slightly curved, and pale yellow in color.

LIFE-HISTORY OF EVENING PRIMROSE CURCULIO.—The common borer of the evening primrose has been studied with some care by Dr. Weed, who reported finding a freshly-emerged adult *Tyloderma foveolatus* in an Oenothera stem, July 22, 1890. This was early, as the main brood develops during August and September. The beetle hibernates in the adult state, the sexes mating early in June. The full-grown larva is 8 mm. long by 2.5 mm. wide, the body, including the thin cervical shield, being white in color, while the head is light brown. The pupa is 7 mm. long, white, and of the normal curculionid form. Pupation takes place in the larval burrow within the stem. Besides *Oenothera biennis*, the insect develops in *Epilobium coloratum*. It is attacked by an external parasite, a species of Bracon.

LIFE-HISTORY OF LIXUS CONCAVUS.—Dr. Weed also reported rearing *Lixus concavus* in numbers from the stems of a common dock (*Rumex crispus*). The larva bores the stem and upper portion of the root, pupating about midsummer, and soon after emerging as a beetle. The larva is attacked by an external Braconid parasite.

OFFICERS ELECTED.—The following officers were elected by the Entomological Club for the ensuing year: President, Professor Herbert Osborn; Vice President, Miss Mary E. Murdfeldt; Secretary, Dr. C. M. Weed.

Crayon Drawing for Photo-Engraving.—The editor of this department has received so many queries concerning the methods and materials employed in preparing the drawings that have lately appeared in the Bulletin of the Ohio Experiment Station, and also in this department of the NATURALIST, that Miss Freda Detmers, by whom they were made, was requested to furnish a brief statement of the main points involved. She has kindly done so, with the following result: "The materials to be used are (1) ordinary bristol board or other stiff white paper; (2) a hard drawing pencil, a 5 H. Faber does very well; (3) a good quality of tracing paper, oiled on both sides; (4) a supply of different grades of the Ross special process stipple drawing paper; (5) Faber's black wax crayon pencils, No. 41; (6) a good black India drawing ink, such as Higgins's water-proof American India ink; (7) Gillott's lithographic crow-quill pens, No. 659. Having these materials, the process of drawing is simple. My usual method is in the case of bisymmetrical insects to measure carefully with a pair of good dividers the length of the insect, transferring the measurements to a piece of paper, and drawing a straight line between the two end points. Then measure the length and breadth of every part of half of the insect, and locate these points on one side of the line. When the outline of half the insect is satisfactory, trace it, straight line included, on the transfer paper. Now reverse the transfer paper, placing the traced outline on the opposite side of the straight line, and rub over it with some hard point,—the point of a lead pencil, for instance. Remove the transfer paper, and the outline of the whole insect appears. This completed outline is then transferred by means of tracing paper to the special process stipple paper, and the drawing proper is made with the wax crayon. Pen and ink is used occasionally to indicate fine hairs, etc. Many beginners make outlines in ink, where simple crayon outlines would be better. It is important to keep the black and white points distinct, not blending them by rubbing."

To this it may be added that all drawings should be reduced about one-third or one-fourth, *i. e.*, to two-thirds or three-fourths the size of the drawing. The engraving should be done by a good establishment. It does not pay to have the cheap processes of zinc-etching, etc., tried on good drawings. Many engraving establishments return soft metal cuts, in which case they should be saved as originals and electrotypes made from them.—C. M. W.

PSYCHOLOGY.

Jastrow on a Writing Test.—In a paper entitled "A Study in Mental Statistics," Prof. Jastrow describes the results of a mental test in which fifty students of a class in psychology, at the University of Wisconsin (twenty-five men and twenty-five women), took part. The task consisted in writing 100 words as rapidly as possible. The material thus collected was utilized to shed light upon (1) the similarity of our ideas and habits of thought, (2) the links that bind our ideas together, and (3) the time required for these processes.

(1) The general tendency to regard one's mental habits and products as singular and original, and consequently to look upon every evidence of similarity of thought as a strange coincidence, receives a set-back from the result of the present and similar studies, for it is found that